



CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

April 15, 2003

H.R. 238 **Energy Research, Development, Demonstration, and Commercial** **Application Act of 2003**

As ordered reported by the House Committee on Science on April 2, 2003

SUMMARY

H.R. 238 would authorize funding for various research activities at the Department of Energy (DOE) and the Environmental Protection Agency (EPA), and would change the way some of DOE's laboratories are regulated. The bill also would authorize loan guarantees for new technologies. Assuming appropriation of the necessary amounts, CBO estimates that implementing H.R. 238 would cost a total of \$32.7 billion over the next five years and a total of \$36.7 billion over the 2004-2013 period. CBO estimates that enacting the bill would not affect direct spending or revenues.

H.R. 238 contains both an intergovernmental and a private-sector mandate as defined in the Unfunded Mandates Reform Act (UMRA) by effectively increasing the annual fees collected from Nuclear Regulatory Commission (NRC) licensees. However, CBO estimates that the fee increase would fall well below the annual thresholds established by that act over the next five years (\$59 million for intergovernmental mandates and \$117 million for private-sector mandates in 2003, adjusted annually for inflation). The remaining provisions of the bill contain no intergovernmental or private-sector mandates, and any costs borne by states would be voluntary or would result from conditions of federal aid.

ESTIMATED COST TO THE FEDERAL GOVERNMENT

The estimated budgetary impact of H.R. 238 is shown in the following table. The costs of this legislation fall within budget functions 250 (general science, space, and technology) 270 (energy), and 300 (natural resources and the environment).

By Fiscal Year, in Millions of Dollars						
	2003	2004	2005	2006	2007	2008
SPENDING SUBJECT TO APPROPRIATION						
Spending for Certain Energy R&D Under Current Law						
Budget Authority ^a	5,251	0	0	0	0	0
Estimated Outlays	5,044	2,722	571	146	47	0
Proposed Changes:						
Specified Authorizations						
Authorization Level	0	6,784	7,071	7,789	8,605	700
Estimated Outlays	0	3,241	6,286	7,344	8,142	4,616
Estimated Authorizations						
Oil and Gas R&D						
Estimated Authorization Level	0	422	437	477	526	553
Estimated Outlays	0	21	258	444	539	512
Loan Guarantees						
Estimated Authorization Level	0	200	200	200	0	0
Estimated Outlays	0	10	80	160	190	120
External Regulation of DOE Labs						
Estimated Authorization Level	0	153	152	104	107	8
Estimated Outlays	0	52	122	137	118	73
Other Activities						
Estimated Authorization Level	0	71	80	90	11	11
Estimated Outlays	0	29	65	83	57	23
Subtotal of Estimated Authorizations						
Estimated Authorization Level	0	845	869	872	644	572
Estimated Outlays	0	113	525	824	904	727
Total Proposed Changes:						
Estimated Authorization Level	0	7,630	7,940	8,660	9,249	1,272
Estimated Outlays	0	3,353	6,811	8,168	9,046	5,344
Spending Under H.R. 238						
Estimated Authorization Level ^a	5,251	7,630	7,940	8,660	9,249	1,272
Estimated Outlays	5,044	6,075	7,382	8,314	9,093	5,344

NOTE: R&D = Research and Development.

- a. The 2003 level is the amount appropriated for that year for DOE programs related to science, energy supply, fossil energy, and certain energy conservation programs. It also includes \$5 million that was appropriated in 2003 for grants made by EPA to upgrade school buses.

BASIS OF ESTIMATE

For this estimate, CBO assumes that the amounts authorized by H.R. 238 will be appropriated near the beginning of each fiscal year and that spending will follow historical patterns for ongoing or similar activities.

Authorization of Specified Amounts

H.R. 238 would specifically authorize the appropriation of \$31.8 billion over the 2004-2012 period for certain research and development (R&D), grant, and loan programs. Over half of this funding (or \$17.9 billion) would be allocated to DOE's science programs, with most of the balance going to R&D related to energy efficiency and various fuel sources. Other provisions specifically authorize \$500 million for grants to states and localities for acquiring vehicles and school buses that use alternative fuels and ultra-low-sulfur diesel fuel; \$125 million for a direct loan for a specific coal project in Alaska; \$23 million for cooperative research between the United States and Mexico; and \$1 million for feasibility studies on using post-consumer carpet in cement kilns and on establishing a center for testing next-generation fuel cells. Estimated outlays for the specified authorizations would total \$29.6 billion over the next five years and \$31.8 billion over the next 10 years.

Estimated Authorizations

In addition to these specified amounts, H.R. 238 would authorize appropriations for other research programs, credit assistance, grants, studies, and regulatory reforms. CBO estimates that implementing these provisions would cost a total of \$3.1 billion over the 2004-2008 period and a total of \$4.9 billion over the 10-year period.

Oil and Gas Research. H.R. 238 would allow DOE to spend 7.5 percent of the government's collections from oil and gas royalties for certain oil and gas research, subject to future appropriation action. This authorization for oil and gas research and development programs would extend through fiscal year 2010. Based on CBO's projection of royalties from oil and gas production, we estimate that this provision would cost between \$400 million to \$500 million annually.

Loan Guarantees. The bill also would authorize DOE to guarantee loans for certain gasification projects that use coal or other natural resources as input. Section 174 would allow DOE to provide a loan guarantee for a 400 megawatt project that uses integrated gasification combined-cycle technology and sells power in deregulated energy markets at competitive rates without subsidies from ratepayers.

The bill also would authorize the department to guarantee loans for at least one polygeneration plant that uses petroleum coke gasification technology. (Polygeneration plants typically produce multiple products, such as electricity, chemicals, and steam.)

Under credit reform procedures, funds must be appropriated in advance to cover the subsidy cost of such loan guarantees, measured on a present-value basis. CBO expects that gasification and polygeneration projects would be riskier than conventional power plants. Both the coal and coke projects would require large capital investments, ranging from over \$500 million for a 400 megawatt gasification plant to \$1 billion or more for some of the polygeneration plants being proposed in the United States. In contrast, a conventional natural gas power plant could be built for half the cost. As a result, the gasification and coke projects are financially viable only when operating costs are well below those using alternative fuels. In addition, the new technologies may pose special technical risks. The credit risk posed by such projects also would depend on the terms of purchase agreements and other contracts.

H.R. 238 does not impose any limits on the amount or terms of those loan guarantees. For this estimate, CBO assumes that DOE would guarantee investments totaling about \$2 billion over the next five years. The subsidy cost of such loan guarantees could vary widely—at worst, the government could absorb all of the risk, effectively converting the loan guarantee into a grant (as occurred in the 1980s for a coal gasification project in North Dakota). For this estimate, CBO assumes that DOE would only guarantee projects if the terms are at least equivalent to those of bonds rated CCC by companies like Standard and Poors and Moodys. Projects with this rating typically have a cumulative default risk of more than 50 percent. At the same time, CBO assumes that coal or coke projects are unlikely to be more creditworthy than conventional power plants (many of which have a BB rating, which suggests a cumulative default risk of about 24 percent). Given this range of possible outcomes, CBO estimates that these provisions would result in loans being guaranteed with a 30 percent subsidy, resulting in a cost of about \$600 million over the 2004-2008 period.

External Regulation. Title II would authorize the Nuclear Regulatory Commission and the Occupational Safety and Health Administration (OSHA) to regulate 10 of DOE's national energy laboratories. Under current law, DOE is responsible for regulating those labs. Based on information from DOE, OSHA, and NRC, CBO estimates that transferring the regulation of those labs to NRC and OSHA would have a gross cost of about \$525 million over the 2004-2008 period, assuming appropriation of the necessary amounts. The NRC, however, has the authority to offset a substantial portion of its appropriation with fees charged to facilities it regulates. After accounting for such collections, we estimate that the net cost of implementing H.R. 238 would be about \$500 million over the same period.

The cost of transferring the regulatory authority to NRC and OSHA would include modifying DOE facilities to meet current NRC and OSHA standards, updating OSHA and NRC rules and regulations to accommodate unique DOE facilities, and decommissioning facilities no longer in use. Based on information from these agencies, CBO estimates that the cost of administrative changes and upgrading DOE facilities would be about \$500 million over the 2004-2008 period. This figure could be lower or higher depending upon how stringently NRC and OSHA regulate the labs. In addition, it is likely that a portion of the cost to upgrade and decommission facilities could be incurred under current law. Finally, CBO estimates that NRC and OSHA would spend about \$7 million annually to inspect and regulate the labs.

External regulation could result in some cost savings to DOE when NRC and OSHA undertake some of DOE's current responsibilities. Under current law, DOE spends about \$145 million a year to regulate these labs. Based on information from DOE and the General Accounting Office, we expect any such savings would eventually be \$5 million to \$10 million a year, but would not be realized for several years.

Other Activities. H.R. 238 would authorize appropriation of the amounts necessary for several other initiatives. It would authorize EPA to issue grants over the 2004-2006 period to demonstrate technologies for retrofitting diesel school buses so they can use cleaner fuels. Based on information from EPA, CBO estimates that the agency would spend a total of \$210 million over the 2004-2008 period for such projects. Another provision would authorize DOE to support the development of biopower and biofuels projects that use certain rice, barley, sugarcane, and forest products. CBO estimates that such activities would cost around \$10 million annually, based on information from DOE. Finally, the bill would authorize a study by the National Academy of Sciences (NAS) on issues related to the commercialization and transfer of technologies developed by DOE. According to the NAS, this study would cost about \$600,000.

INTERGOVERNMENTAL AND PRIVATE-SECTOR IMPACT

Under current law, the NRC collects annual fees from its licensees, both public and private, to offset a major portion of its general fund appropriation. Because H.R. 238 would shift the regulatory responsibility for certain nonmilitary energy laboratories from the Department of Energy to NRC, CBO expects that additional fees would be collected from the licensees to cover the cost of the external regulation. The duty to pay those fee increases would be considered both an intergovernmental and a private-sector mandate under UMRA as it results in an increase in the cost of an existing mandate. Assuming amounts necessary to cover the costs of NRC's additional regulatory responsibilities are appropriated, CBO estimates the additional fees would total \$24 million over the next five years. Those additional costs to

NRC licensees would fall well below the annual thresholds established by UMRA (\$59 million for intergovernmental mandates and \$117 million for private-sector mandates in 2003, adjusted annually for inflation).

The remaining provisions of H.R. 238 contain no intergovernmental or private-sector mandates as defined in UMRA. States would benefit from the research and development initiatives that seek greater energy efficiency in all major energy sectors. States that participate in the proposed grant programs for secondary battery use, advanced technology transfer centers, renewable energy in government buildings, clean school and transit buses, and other initiatives may face match requirements and other costs, but any such costs result from conditions of federal aid, and thus, would be voluntary.

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